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EXAMINER

MAURO JR, THOMAS J

ART UNIT

PAPER NUMBER

2143

DATE MAILED: 06/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/732,219

Applicant(s)

BERNS, GREGORY S.

Examiner

Thomas J. Mauro Jr.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 December 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-74 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-74 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 December 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2,3.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-74 are pending and are presented for examination. A formal action on the merits of claims 1-74 follows.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 9, 23, 31, 45 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pinsky et al. (U.S. 5,655,084) in view of Biswal et al., "Blind Source Separation of Multiple Signal Sources of fMRI Data Sets Using Independent Component Analysis".

Regarding claim 1, Pinsky teaches a method of providing image analysis comprising:
receiving from a client via a communications network a data set containing information related to a magnetic resonance image (MRI) [Pinsky -- Figures 1, 2A and 2B, Col. 1 lines 44-49, Col. 3 lines 20-23, Col. 3 lines 66-67 - Col. 4 lines 1-2 and lines 30-33 and Col. 5 lines 42-59 – MRI data set is sent from acquiring site, i.e. hospital, doctor, imaging center, etc., over a network to a radiology hub for interpretation, i.e. analysis]; and
delivering to the client via a communications network information related to the data set [Pinsky -- Col. 4 lines 49-58 and Col. 6 lines 48-58 – Interpretation, i.e. analysis or study, of MRI data set is routed back to client, i.e. hospital, doctor, etc., over a communications

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network].

Pinsky fails to teach fMRI analysis of a brain, including identifying a plurality of spatially independent components related to the data set by applying a blind source separation algorithm to the data set.

Biswal, however, discloses using functional MRI (fMRI) to measure local changes in blood volume, flow, and oxygenation within an individual's brain by identifying independent components by applying a blind source separation algorithm to the fMRI data set [**Biswal --**

Page 265 "Purpose" section and left column lines 1-4 and Page 266 left column lines 1-54 and right column lines 1-9 – Blind source separation algorithm is used to identify independent components from an fMRI data set].

Both Pinsky and Biswal are concerned with analysis of MRI images.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the usage of fMRI analysis of a brain using a blind source separation algorithm to identify independent components of a data set, as taught by Biswal into the invention of Pinsky, in order to provide greater in depth analysis by separating and identifying multiple signal components present in an fMRI data set and their sources.

Regarding claim 9, this is a method claim which has similar limitations to the method claimed in claim 1. In addition, this claim recites receiving a plurality of client data sets from a plurality of clients via a network and providing data analysis services to the plurality of clients. Pinsky discloses that multiple acquiring sites, i.e. multiple hospitals, provide imaging data to radiology hubs to provide image analysis [**Pinsky -- Figure 1 and Col. 2 lines 66-67 – Col. 3**

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lines 1-13]. Therefore, because these claims are similar, claim 9 is rejected under the same rationale as claim 1.

Regarding claim 23, this is a system claim corresponding to the method claimed in claim 1. It has similar limitations; therefore, claim 23 is rejected under the same rationale.

Regarding claim 31, this is a system claim corresponding to the method claimed in claim 9 above. It has similar limitations; therefore, claim 31 is rejected under the same rationale.

Regarding claim 45, this is a system claim corresponding to the method claimed in claim 1. It has similar limitations; therefore, claim 45 is rejected under the same rationale.

Regarding claim 60, Pinsky teaches a computer-readable medium for use by a computer for providing data analysis services [**Pinsky -- Col. 10 lines 21-45 – Interpretations are performed on workstations having a processor and storage for running programs for analysis services**]. The remaining limitations of claim 60 are similar to the limitations set forth in claim 1. Therefore, claim 60 is rejected under the same rationale.

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4. Claims 2, 13, 24, 35, 46, 61 and 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pinsky et al. (U.S. 5,655,084 and Biswal et al., "Blind Source Separation of Multiple Signal Sources of fMRI Data Sets Using Independent Component Analysis", as applied to claim 1 above, in view of Applicant's Admitted Prior Art (AAPA).

Regarding claim 2, Pinsky-Biswal teach the invention substantially as claimed, as aforementioned in claim 1 above, but fails to explicitly teach applying a singular value decomposition algorithm to the data set.

AAPA, however, discloses using a singular value decomposition algorithm to identify a set of independent components using a well-known and widely used technique [AAPA -- Page 6 lines 1-8 and Page 16 lines 6-19].

Therefore, it would have been obvious to one of ordinary skill in the art to use a widely known and used singular value decomposition algorithm to identify independent components, as taught by AAPA into the invention of Pinsky-Biswal, in order to dimensionally reduce the data.

Regarding claim 13, this is a method claim similar to the method claimed in claim 2. It has similar limitations; therefore, claim 13 is rejected under the same rationale.

Regarding claims 24, 35 and 46, these are system claims corresponding to the method claimed in claim 2. They have similar limitations; therefore, claims 24, 35 and 46 are rejected under the same rationale.

Regarding claims 61 and 71, these are computer-readable medium claim corresponding to the method claimed in claim 2. They have similar limitations; therefore, claims 61 and 71 are rejected under the same rationale.

5. Claims 3, 5-8, 10-12, 14, 16-20, 22, 25, 27-30, 32-34, 36, 38-42, 44, 53-55, 57-59, 62, 64-70, 72 and 74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pinsky et al. (U.S. 5,655,084 and Biswal et al., "Blind Source Separation of Multiple Signal Sources of fMRI Data Sets Using Independent Component Analysis", in view of Sloane (U.S. 5,911,132).

Regarding claim 3, Pinsky-Biswal teach the invention substantially as claimed, as aforementioned in claim 1 above, but fail to explicitly teach charging the client for delivering the components, i.e. analysis of the data set.

Sloane, however, discloses a healthcare information delivery system which helps diagnose a patient's illness, i.e. a broken bone, upon which the patient is billed, i.e. charged, for the services **[Sloane -- Col. 2 lines 64-67, Col. 3 lines 7-10 and Col. 5 lines 12-19 – Analysis of symptoms and imaging information is used to provide diagnosis which is delivered to the client, i.e. patient, upon which he/she is billed for the services].**

Both Pinsky-Biswal and Sloane are concerned with providing medical services, specifically diagnostic services, to clients.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the billing of clients for medical diagnostic services, as taught by

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Sloane into the invention of Pinsky-Biswal, in order to obtain the necessary funding to provide such diagnostics as a service to clients.

Regarding claim 5, Pinsky-Biswal-Sloane teach the invention substantially as claimed, further comprising: storing the plurality of independent components in a database containing information relating to a plurality of sets of other independent components corresponding to other individual's independent components [Sloane -- **Figure 7, Col. 4 lines 30-53, Col. 5 lines 38-54 and Col. 7 lines 37-67 – Col. 8 lines 1-20 – Database, located on CDC server, contains patient transaction records compiled from all across the country/world. Thus the database can store independent information relating to one patient, i.e. patient transaction record, along with other independent information from other patients**].

Regarding claim 6, Pinsky-Biswal-Sloane teach the invention substantially as claimed, including receiving a request from the client via the communications network to compare the plurality of independent components to the plurality of sets of other independent components in the database [Sloane -- **Figures 1 and 7, Col. 5 lines 38-54 – E-doc sends request over network to CDC server to provide further consultation for diagnosis by having the CDC server compare the one patient's symptoms and information with other people's symptoms having a given illness or disease. This provides help in diagnosing a given patient and to further confirm diagnosis**].

Regarding claim 7, Pinsky-Biswal-Sloane teach the invention substantially as claimed, as aforementioned in claim 6 above, including:

(i) comparing the plurality of independent components to the plurality of sets of independent components in the database [**Sloane -- Col. 5 lines 38-54 – CDC server is consulted to search, i.e. compare, prior transaction records received for the given patient symptoms and information stored within the database**]; and

(ii) delivering to the client via the communications network information based on the comparison [**Sloane -- Col. 6 lines 33-48 – Patient is informed of diagnosis and treatment information along with other information received from CDC, i.e. expected symptoms, duration, etc.**].

Regarding claim 8, Pinsky-Biswal-Sloane teach the invention substantially as claimed, as aforementioned in claim 7 above, including charging the client for delivering the information based on the analysis, i.e. comparison [**Sloane -- Col. 5 lines 12-19 – Analysis of symptoms and imaging information is used to provide diagnosis which is delivered to the client, i.e. patient, upon which he/she is billed for the services**].

Regarding claim 10, Pinsky-Biswal teach the invention substantially as claimed, as aforementioned in claim 9 above, but fail to explicitly teach storing the sets of independent components, i.e. information, in a database.

Sloane, however, discloses a database, located on CDC server which holds patients record information, i.e. independent components, such as image data, diagnosis, symptoms, etc. [**Sloane**

-- Figure 7, Col. 4 lines 30-53, Col. 5 lines 38-54 and Col. 7 lines 37-67 – Col. 8 lines 1-20 – Database, located on CDC server, contains patient transaction records compiled from all across the country/world].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the storing of patient record information in a database, as taught by Sloane, into the invention of Pinsky-Biswal, in order to provide a data structure to hold information which can be used to analyze other patient symptoms in helping diagnose a disease.

Regarding claim 11, Pinsky-Biswal-Sloane teach the invention substantially as claimed, as aforementioned in claim 10 above, including comparing each of the plurality of sets of independent components to the other of the plurality of sets of independent components **[Sloane -- Col. 5 lines 38-54 – CDC server is consulted to search, i.e. compare, prior transaction records received for the given patient symptoms and information stored within the database].**

Regarding claim 12, Pinsky-Biswal-Sloane teach the invention substantially as claimed, as aforementioned in claim 11 above, including identifying common components which exist in a scientifically-significant portion of the plurality of sets of independent components **[Sloane -- Col. 5 lines 38-54 – Patient's symptoms are compared to other patients to see if a significant portion of symptoms are similar, i.e. in a given geographic region which symptoms may point to an outbreak of food poisoning].**

Regarding claim 14, this is a method claim similar to the method claimed in claim 3 above. It has similar limitations; therefore, claim 14 is rejected under the same rationale.

Regarding claim 16, Pinsky teaches a method comprising:

receiving from a client via a communications network a client data set containing information related to a magnetic resonance image [**Pinsky -- Figures 1, 2A and 2B, Col. 1 lines 44-49, Col. 3 lines 20-23, Col. 3 lines 66-67 - Col. 4 lines 1-2 and lines 30-33 and Col. 5 lines 42-59 -- MRI data set is sent from acquiring site, i.e. hospital, doctor, imaging center, etc., over a network to a radiology hub for interpretation, i.e. analysis**];

Pinsky fails to explicitly teach a functional MRI identifying a plurality of spatially independent components by applying a blind source separation algorithm, comparing the independent components to other independent components in a database, the set of components which exist in a scientifically significant portion of sets of independent components of fMRI data sets in a database.

Biswal, however, discloses using functional MRI (fMRI) to measure local changes in blood volume, flow, and oxygenation within an individual's brain by identifying independent components by applying a blind source separation algorithm to the fMRI data set [**Biswal -- Page 265 "Purpose" section and left column lines 1-4 and Page 266 left column lines 1-54 and right column lines 1-9 -- Blind source separation algorithm is used to identify independent components from an fMRI data set**].

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In addition, Sloane teaches comparing each of the plurality of sets of independent components to the other of the plurality of sets of independent components [**Sloane -- Col. 5 lines 38-54 – CDC server is consulted to search, i.e. compare, prior transaction records received for the given patient symptoms and information stored within the database**], a database, located on CDC server which holds patients record information, i.e. independent components, such as image data, diagnosis, symptoms, etc. [**Sloane -- Figure 7, Col. 4 lines 30-53, Col. 5 lines 38-54 and Col. 7 lines 37-67 – Col. 8 lines 1-20 – Database, located on CDC server, contains patient transaction records compiled from all across the country/world**] and identifying common components which exist in a scientifically-significant portion of the plurality of sets of independent components [**Sloane -- Col. 5 lines 38-54 – Patient's symptoms are compared to other patients to see if a significant portion of symptoms are similar, i.e. in a given geographic region which symptoms may point to an outbreak of food poisoning**].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a functional MRI identifying a plurality of spatially independent components by applying a blind source separation algorithm, as taught by Biswal, along with comparing the independent components to other independent components in a database, the set of components which exist in a scientifically significant portion of sets of independent components of fMRI data sets in a database, as taught by Sloane, into the invention of Pinsky, in order to provide greater in depth analysis by separating and identifying multiple signal components present in an fMRI data set and their sources in addition to providing a data structure to hold information which can be used to analyze other patient symptoms in helping diagnose a disease

Regarding claim 17, this is a method claim having limitations similar to the method claimed in claim 11. Therefore, claim 17 is rejected under the same rationale.

Regarding claim 18, Pinsky-Biswal-Sloane teach the invention substantially as claimed, as aforementioned in claim 17 above, including delivering the client information via the communications network [**Pinsky -- Col. 4 lines 49-58 and Col. 6 lines 48-58 – Interpretation, i.e. analysis or study, of MRI data set is routed back to client, i.e. hospital, doctor, etc., over a communications network**].

Regarding claim 19, this is a method claim corresponding to the method claimed in claim 2. It has similar limitations; therefore, claim 19 is rejected under the same rationale.

Regarding claim 20, this is a method claim corresponding to the method claimed in claim 8. It has similar limitations; therefore, claim 20 is rejected under the same rationale.

Regarding claim 22, Pinsky-Biswal-Sloane teach the invention substantially as claimed, as aforementioned in claim 16 above, including modifying the set of independent components in the database based on the plurality of independent components of the client data set [**Sloane -- Col. 4 lines 30-53, Col. 5 lines 44-54 and Col. 7 lines 32-36 – Transaction records are modified to indicate the outcome and various symptoms a patient has had with the disease. In addition, the database expert system is modified to better be able to diagnose diseases and illnesses based upon outbreaks or events currently occurring in a geographic locality**].

Regarding claims 25, 27, 28, 29, 30, 32, 33, 34, 36, 38, 39, 40, 41 and 42, these are system claims corresponding to the method claimed in claims 3, 5, 6, 7, 8, 10, 11, 12, 14, 16, 17, 18, 19 and 20. They have similar limitations; therefore, claims 25, 27, 28, 29, 30, 32, 33, 34, 36, 38, 39, 40, 41 and 42 are rejected under the same rationale.

Regarding claims 44 and 59, these are system claims corresponding to the method claimed in claim 22. They have similar limitations; therefore, claims 44 and 59 are rejected under the same rationale.

Regarding claim 53, this is a system claim similar to the method claimed in claim 16. It has similar limitations; therefore, claim 53 is rejected under the same rationale.

Regarding claims 54-55, these are system claims which correspond to the method claimed in claim 7. They have similar limitations; therefore, claim 54-55 are rejected under the same rationale.

Regarding claim 57, this is a system claim similar to the method claimed in claim 8. It has similar limitations; therefore, claim 57 is rejected under the same rationale.

Regarding claims 62, 64, 65, 66, 67, 69, 70 and 72, these are computer-readable medium claims corresponding to the method claimed in claims 3, 5, 6, 7 and 8. They have similar

limitations; therefore, claims 62, 64, 65, 66, 67, 69, 70 and 72 are rejected under the same rationale.

Regarding claim 68, this is a computer-readable medium claim corresponding to the method claimed in claim 16. It has similar limitations; therefore, claim 68 is rejected under the same rationale.

Regarding claim 74, this is a computer-readable medium claim corresponding to the method claimed in claim 22. It has similar limitations; therefore, claim 74 is rejected under the same rationale.

6. Claims 4, 15, 21, 26, 37, 43, 58, 63 and 73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pinsky et al. (U.S. 5,655,084 and Biswal et al., "Blind Source Separation of Multiple Signal Sources of fMRI Data Sets Using Independent Component Analysis", as applied to claim 1 above, in view of Sloane (U.S. 5,911,132) and further in view of Stoodley (U.S. 6,611,846).

Regarding claim 4, Pinsky-Biswal teach the invention substantially as claimed, but fails to teach wherein the receiving from a client and the delivering to the client is via the Internet and viewing the components, i.e. medical information, using a web browser.

Sloane, however, teaches wherein the receiving from the client and the delivering to the client is performed via the Internet [Sloane -- **Figure 1 and Col. 2 lines 64-67 – Clients are other equipment, i.e. imaging server, pharmacy, CDC server, etc., are all connected via the Internet**].

In addition, Stoodley discloses a method and system for the storage and retrieval of medical information which uses a browser to receive patient data over a network, i.e. the Internet, from a server [Stoodley -- **Col. 5 lines 2-5 and Col. 15 lines 47-52**].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the receiving from the client and the delivering to the client information via the Internet, as taught by Sloane, along with the use of a browser to view medical information, as taught by Stoodley into the invention of Pinsky-Biswal, in order to provide a common and well-known user interface for retrieving information from an HTTP request stored on a server over a Wide Area Network (WAN).

Regarding claims 15 and 21, these are method claims similar to the method claimed in claim 4. They have similar limitations; therefore, claims 15 and 21 are rejected under the same rationale.

Regarding claims 26, 37 and 43, these are system claims corresponding to the method claimed in claims 4, 15 and 21 respectively. They have similar limitations; therefore, claims 26, 37 and 43 are rejected under the same rationale.

Regarding claim 58, this is a system claim corresponding to the method claimed in claim 4. It has similar limitations; therefore, claim 58 is rejected under the same rationale.

Regarding claims 63 and 73, these are computer-readable medium claims corresponding to the method claimed in claim 4. They have similar limitations; therefore, claims 63 and 73 are rejected under the same rationale.

7. Claims 47, 49-52 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pinsky et al. (U.S. 5,655,084), Biswal et al., "Blind Source Separation of Multiple Signal Sources of fMRI Data Sets Using Independent Component Analysis" and Applicant's Admitted Prior Art (AAPA), in view of Sloane (U.S. 5,911,132).

Regarding claims 47 and 49, these are system claims corresponding to the method claimed in claims 3 and 10 respectively. They have similar limitations; therefore, claims 47 and 49 are rejected under the same rationale.

Regarding claims 50-52, these are system claims corresponding to the method claimed in claims 5-6, 7 and 8 respectively. They have similar limitations; therefore, claims 50-52 are rejected under the same rationale.

Regarding claim 56, this is a system claim corresponding to the method claimed in claim

2. It has similar limitations; therefore, claim 56 is rejected under the same rationale.

8. Claim 48 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pinsky et al.

(U.S. 5,655,084), Biswal et al., "Blind Source Separation of Multiple Signal Sources of fMRI

Data Sets Using Independent Component Analysis" and Applicant's Admitted Prior Art

(AAPA), as applied to claim 46 above, in view of Sloane (U.S. 5,911,132) and further in view of Stoodley (U.S. 6,611,846).

Regarding claim 48, this is a system claim corresponding to the method claimed in claim

4. It has similar limitations; therefore, claim 48 is rejected under the same rationale.

Conclusion


9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


- Jago et al. (U.S. 5,938,607) discloses a diagnostic imaging system which aids in providing diagnosis of patient conditions by comparing patient images to a reference image library.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas J. Mauro Jr. whose telephone number is 703-605-1234. The examiner can normally be reached on M-F 8:00a.m. - 4:30p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David A. Wiley can be reached on 703-308-5221. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


TJM
June 7, 2004


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